A Study of ICT tools with Respect to Learner's Achievement using Evolutionary Algorithm Based Techniques

A

Synopsis

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Abstract of proposed work plan / Problem:

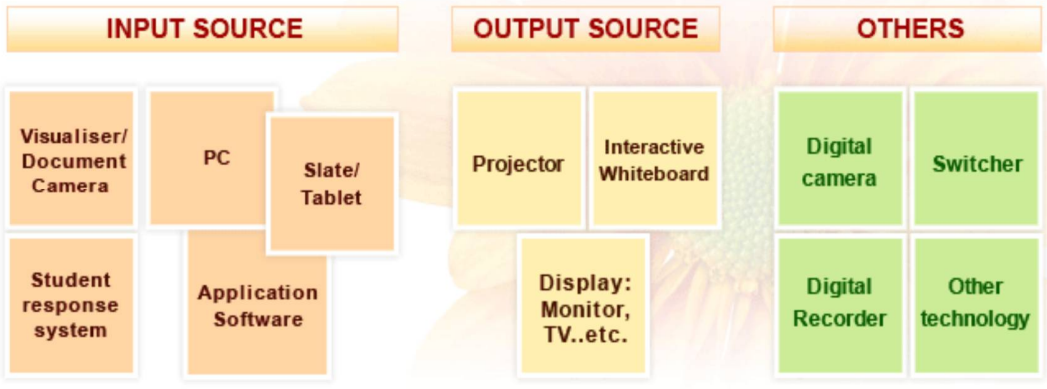
ICT tools are playing an increasingly large role in education as globalization ensues and the classroom is becoming more tech savvy. Access to communication technology is constantly growing. ICT tool refers more broadly to audio, visual, and interactive mediums working in a unified manner to accomplish the sharing and presentation of information. There are many education technology solutions provided in the world which may cause confusion among educators about how to choose the right ICT tool .

The aim of this research is to study and find out the impact of ICT tools on learning measures towards the achievement of different levels of students with the help of evolutionary algorithm based techniques. Initially we would like to find out which ICT tool become appropriate for a specific level of students according to the theory of education with the help of educationalist. Then we would like to find the effectiveness test of ICT tool like audio, video, text and video clips on learner with certain expectation. After this, comparison of ICT tools to test the performance with expectation. This research contains taking experiments , sampling and classifications using ICT tool and without using ICT tools , for that we would like to classify normal students into two groups namely treatment group (teaching using ICT tool) and the control group (teaching without using ICT tool), this classification is carried out using evolutionary algorithm based techniques. Before and after the learning process conduct the effectiveness test of ICT tools, gather the sample data and then find the learning measure depending upon expectation and achievement for the treatment group compared to the control group. After it, we would like to test the performance, for that we would compare ICT tools with expectation and achievement using statistical methods. In this research, we would like to carry out continuous comprehensive evaluation process. At the end indicate the results and based on the findings, several recommendations to be specified.

1. Introduction:

The effective use of any technology in teaching requires thoughtful consideration and planning. The term “Information Communication Technology” refers to a broad range of digital tools and resources that allow users to view, analyze, manipulate, and/or communicate complex information, such as historical, spatial, and statistical data. Here, we would like to use different number of tools in this research, like audio/video tools and video clips.

Educational ICT tools can be divided into 3 categories: Input source, Output source and others



Worldwide research has shown that ICT can lead to improved student learning and better teaching methods. A report made by the National Institute of Multimedia Education in Japan, proved that an increase in student exposure to educational ICT through curriculum integration has a significant and positive impact on student achievement, especially in terms of Knowledge, Comprehension, Practical skill and Presentation skill in subject areas such as mathematics, science, and social study.

Let's have a look at the advantages of ICT tools for education and discover what kind of education ICT solution is suitable for student needs.

Advantages of ICT tools are:

1. Through ICT, images can easily be used in teaching and improving the retentive memory of students.
2. Through ICT, teachers can easily explain complex instructions and ensure students' comprehension.
3. Through ICT, teachers are able to create interactive classes and make the lessons more enjoyable, which could improve student attendance and concentration.

Before adopting an ICT tool, whether it supports your learning objectives for the course

and whether it is feasible and appropriate to your students, constraints, and context. In learning process, students develop their skill or technical competencies, a particular ICT tool help students meet the learning achievement or another tool be more appropriate. Also using this research, it specifies the structure the course or assignment to ensure that your learning achievement is reach.

Think about students and constraints point of view, students have the technical skills to learn the concept using the tool in the time available, also they be able to use it effectively and represent majors and intended professions for which the tool is relevant. Yours constraints have sufficient time to teach with the help of the tool, also you must have the resources like computer lab space, software etc that you need.

When think about the context in which the tool will be used in other courses in the curriculum , how will that affect whether or how you introduce the tool under consideration?

With the help of this research, also specify some tradeoffs of using the tools in different student's levels. The adoption of any tool entails tradeoffs. Instructors will assess tradeoffs differently, depending on their objectives for student learning and standard practices in their professions, but here are some potential tradeoffs to using information communication tools.

Incorporating a new tool into your course may take extra time and effort in preparation, in the classroom, and during office hours. However, if students' learning gains are significant or if you innovate teaching approaches that contribute to your department or discipline, it may be worth the investment. Making room in a course to introduce, practice, and use a new tool may also require that you give up other content you value. Again, this may or may not be worth it to you, depending on how you weigh the gains and losses.

Information communication tools can be powerful teaching resources, but they will not enhance learning automatically. Instructor focuses on the technical capabilities of a tool**:** Instructor must design the subject material so that students should learn the concept in these areas. Make sure your performance criteria are consistent with these objectives as well.

2. Review of Literature and Development in the Subject :

B.Sriram (June 2015) explains the ICT innovations have been significantly improved the learning processes in various degrees. The educational services uses various ICT tools in measuring the academic performances of the learners. The higher educational providers use different learning management systems. They maintain e – learning portals and deliver sufficient learning materials to provide the meaningful learning atmosphere. These learning management systems are also used to measure the learners academic performance using online examinations, multiple choices etc.

Princy Sharma (July 2014) found that teaching through ICT tools enhances academic achievement of the pupil teachers. The educational implications of their study are :-

- ICT tools provide improvement in the academic performance.
- The spirit of co-operation and competition should be developed through mail services.
- Possibilities of students updating of current knowledge could be enhanced.
- ICT tools could be used by the teachers to enhance their teaching.
- Books based on ICT could be developed.
- In- service programmes, refresher programmes, orientation schedule and even the pre-service teacher training programme should be provided for newer ICT based methods.
- School infrastructure should be stressed in terms of facilities to promote and use ICT tools.

Devashish Goswami (2013), suggesting some recommendations in their research paper ICT in Education and its Barriers, in this paper he suggest that the ultimate aim of ICT adoption now is to facilitate effective transformation of learning. The adoption and use of ICTs in education have a positive impact on teaching, learning, and research. Undoubtedly, ICTs are potentially a useful tool both for managing education and for teaching. The overall literature suggests that successful ICT integration depends on many factors. National policies as well as institute policies and actions taken have a deep impact on the same. Similarly, there needs to be an ICT plan, support and training to all the stakeholders involved in the integration. Finally, he explains technology is never a substitute for good teaching. Without skilled instructors, no electronic delivery can achieve good results.

Adel Ben Youssef and Mounir Dahmani *(2008)* is to examine the relationship between the use of information and communication technologies (ICT) and student performance in higher education. This article tried to summaries the main findings in economic literature concerning ICT usage and student achievement. ICT seems to have a profound impact on the process of learning in higher education by offering new possibilities for learners and teachers. These possibilities can have an impact on student performance and achievement. Observing the performance of students needs to deal more with these topics and less with knowledge of specific topic and curricula.

Yves Punie, Dieter Zinnbauer, and Marcelino Cabrera (2008) explain in their publication “A review of the impact of ICT on learning”, there is evidence that ICT is having a positive impact on education and training in Europe. In order to understand the impact of ICT on learning, a holistic approach is needed that takes into account the socio-economic context, the learning environment, and teacher training.

Wenglinsky (2006) found that the integration of technology for younger students (middle school and lower) increased achievement when used as a means of enriching the lesson, providing opportunities for students to attain higher-order thinking. On the other hand, technology in high school environments affected achievement positively when used as tool to "deepen their thinking and enhance their work products through technology driven processes". (p. 31)

The British report ImpaCT2, (Harrison, Lunzer, Tymms, Fitz-Gibbon, and Restorick, 2004). which has been deemed one of the most thorough investigations into the relationship between ICT and educational achievement, The results of this study illustrates "statistically significant findings "that ICT does play a role in student achievement; however the benefits are not "spread evenly across all subjects" with higher levels of achievement were evident in Science, Math, English, Modern Foreign Languages and Design Technology.

Reynolds, Treharne, & Tripp (2003) being said, when examining the integration of ICT in schools, any learning prior to technology integration must serve as a starting point so that any advances in achievement are clear and can be attributed to the enhancement of resources.

Reynolds et al (2003) in their survey of teachers on the use of ICT in British secondary schools reported that ICT tools enabled students to "express themselves more clearly" within the subject of literacy (p. 161). Tools such as word processors, presentation software, and text to speech software were also used to scaffold student writing, reading, and spelling and literacy skills. Within the subject of math and science, students used ICT tools to perform calculations , computations and to make abstract ideas concrete by using animations, videos, and simulations,

Corbett & Willms, 2002 , internationally, a great deal of resources have been put towards purchasing computers, hardware, software, and networking systems in the attempt of educating and providing students with the technological skills that are needed in the 21st century. Each nation is in competition to educate and train their citizens to become the leaders and inventors of tomorrow. The information economy requires a "skilled work force to cope with constant changes in the workplace as well as in day-to-day living. Adults require higher skill levels as society becomes more complex, low-skill jobs decrease and literacy requirements increase dramatically".

3. Objectives of Research / Proposed Hypothesis:

The main objective of this research is to study and find out the Impact of ICT tool at different levels of students on learners achievement. With this we find out whether the student gets the knowledge of a concerned subject with the help of tools or not? , Whether the student will able or

efficient to grasp the skill? And then depending upon this parameter also finds the performance of ICT tools i.e. audio/video, text and video clips on student learning.

Here are the objectives that we have targeted:

- To find appropriate ICT tool as per the level of learner with the help of educationalist.
- Evolutionary algorithm based techniques will be applied to classify the ICT tools as well as learners.
- To design the ICT tools as per the learners requirements.
- Effectiveness test of ICT tool with respect to expectation of learners point.
- Comparison of a ICT tools through test performance with expectations and achievement.

To fulfill this objectives through this research, we would like to take different levels of students i.e. primary, secondary and higher secondary for experiment purpose .

4. Methodology to be adopted:

Persons sometimes ask if a specific technology will enhance student learning. A tool learning benefits depends on when, where , how and why you use it.

An “effective use of an ICT tool” is a complex concept and it cannot be analyzed without the knowledge of users of the tool or a context where it is used.

Sampling, experiments and classifications:

This research contains the classification, measurement and tool analysis is performing using the sampling, experiment and classification methods.

For that the proposed research work involves experiment the different tool in classroom for teaching, classification of students to learn through traditional method and ICT methods and then from the data find the impact of ICT tool on learning measure using evolutionary algorithm based techniques and statistical methods.

Initially in this research we would like to study various audio-video tools currently used to improve the student learning and find appropriate ICT tool in consultation with educationalist. Actually the proposed research contains to find the impact of ICT tools like audio, video and video clip on learning achievement, this work have to be done with the help of taking samples, experiment using these tools, gather the data with different classified normal students like treatment and control based strategy. We would like to classify normal students into two groups namely treatment group (teaching using ICT tool) and the control group (teaching without using ICT tool). Before and after the learning process conduct the effectiveness test of ICT tools, gather the sample data and then find

the learning measure depending upon expectation and achievement for the treatment group compared to the control group. Here we would like to compare expectation with achievement data. Here we would like to use evolutionary algorithm based techniques to find the results of classification. Then find the performance of tools with the help of different statistical methods applied on gathered normal student data.

5. Importance of study / society application:

5.1 International status:

Through this research, I ensure that all countries, both developed and developing, have access to the best ICT tools necessary to prepare young people to play full roles in modern society and to contribute to a knowledge nation.

To specify a curriculum in ICT tools for schools that is in line with current international trends. To outline a programme of professional development for teachers necessary to implement the specified ICT curriculum successfully.

5.2 National status :

Wider participation of all sections of society in strengthening the school education process through appropriate utilization of ICT tool.

To provide universal, equitable, open and free access to ICT and ICT enabled tools and resources to all students and teachers. Conform the National Policy by the Government of India (http://egovstandards.gov.in). Given the diversity of the country's educational, linguistic and social situation, a Unicode fonts will be used to ensure universal access, compatibility and translation.

Use of interactive ICT tools for teaching and learning, e.g. virtual laboratories will be promoted. The development of digital learning resources in the form of e-books, animations, lessons, exercises, interactive games, models and simulations, videos, presentation slides, plain text materials, graphics, or any combinations of the above, will be encouraged.

5.1 Significance of the study:

This research is significant because of many aspects, they are given below, It is widely recognized that learners are motivated and purposefully engaged in the learning process when concepts and skills are underpinned with technology and sound pedagogy.

ICT tool can improve the learning process through the provision of more interactive educational materials that increase learner motivation and facilitate the acquisition of basic skills. The use of various tools can offer a more challenging and engaging learning environment for students of all ages.

- It helps to choose appropriate tool as per student level.
- It helps to design the ICT tool as per learner's requirement.
- This research reduce the gap between teacher to teacher disparate.
- It reduce the dependency on educator.
- Using this research, bring all the learners at one level.

6 Proposed work plan / formulation and structure of study:

6.1 Year wise plan of work and targets to be achieved.

Year	Duration	Plan of work
I	Aprl 2016 -- Oct 2016	Review the research happening in this area.
	Nov 2016 -- April 2017	Select the location and schools where we would like to study and find appropriate ICT tools at different levels of students .
II	May 2017 – Oct 2017	Sampling and experiment with using and without using ICT tools for finding effectiveness test of the tool on different levels of students. Note the data and continue the evaluation.
	Nov 2017 – April 2018	Evolutionary algorithm based techniques will be applied on the data for classification purpose.
III	May 2018 – Oct 2018	Compare different ICT tools performance with expectation and achievement using statistical methods.
	Nov 2018 – May 2019	Conclude and find the impact of ICT tools on learning measure and specify the achievement report with recommendations.

Signature

Research Scholar

Signature

Research supervisor / Guide / Co-guide

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